

In the Claims:

Please replace claims 13 and 17-20, all as shown below. All pending claims are reproduced below, including unchanged claims and marked up versions of amended claims.

1. (Withdrawn) A self-aligned transistor, comprising:

a first silicon portion on an isolation layer, the silicon portion having formed therein a source region and a drain region separated by a channel region, and having a first side and a second side and a top portion;

a gate oxide surrounding the channel on said first side, second side and top portion; and

a first, a second and a third silicon gate regions surrounding the first silicon portion about the first side, second side and top portion and the channel region.

2. (Withdrawn) The transistor of claim 1 wherein said first silicon portion includes an N+ source and drain region and a P-type channel region.

3. (Withdrawn) The transistor of claim 2 wherein said first portion is formed of contiguous deposited polysilicon.

4. (Withdrawn) The transistor of claim 3 wherein said second portion is formed of contiguous deposited polysilicon.

5. (Withdrawn) The transistor of claim 3 wherein said first gate, second gate, and third gate have an N+ dopant concentration matching the source and drain regions.

6. (Withdrawn) The transistor of claim 3 wherein said first gate region has an N+ doping and the second gate region has a P+ doping.
7. (Withdrawn) The transistor of claim 1 wherein said isolation layer comprises a buried oxide region of a silicon-on-insulator substrate.
8. (Withdrawn) The transistor of claim 7 wherein said first silicon portion, first gate, and second gate are formed in a contiguous horizontal plane in said silicon-on-insulator substrate.
9. (Withdrawn) The transistor of claim 1 wherein said first silicon portion has a width in a range between 20 nanometers and 150 nanometers.
10. (Withdrawn) The transistor of claim 1 wherein a gate oxide separates said first and second silicon portions.
11. (Withdrawn) The transistor of claim 1 wherein said gate oxide has a thickness of between 1.2-1.7 nanometers.
12. (Withdrawn) The transistor of claim 1 wherein the first and second polysilicon regions are surrounded by a conformal oxide.
13. (Currently Amended) A method for manufacturing a ~~dual~~three sided gate transistor

device, comprising:

- (a) providing a substrate having a buried oxide region;
- (b) depositing a first nitride mask layer having a pattern overlying a silicon region;
- (c) forming a trench in said substrate with a depth to said buried oxide;
- (d) depositing a ~~TEOS~~conformal oxide in said trench;
- (e) forming vias in said ~~TEOS~~conformal oxide adjacent to said silicon region and

removing a portion of said first nitride mask to expose a portion of said silicon region;

- (f) depositing polysilicon in said vias and on said portion of said silicon region; and
- (g) implanting an impurity into exposed portions of polysilicon in said trench ~~and of~~

~~said silicon on insulator substrate underlying said second nitride layer.~~

14. (Original) The method of claim 13 wherein said step (c) is performed by:

depositing a nitride mask layer; forming a trench window in said nitride mask layer; and etching said substrate to expose said buried oxide.

15. (Original) The method of claim 13 wherein said step (d) is performed by:

depositing a TEOS layer to fill the trench to a level equivalent to said first nitride mask layer.

16. (Previously Amended) The method of claim 13 wherein said step (e) comprises:

depositing a photoresist layer; and

etching the vias and the first nitride layer through an opening formed in said photoresist layer.

17. (Currently Amended) The method of claim 13 wherein said step (g)~~(f)~~ comprises:  
implanting arsenic at an energy of 15-20 KeV with a zero degree tilt to provide a  
concentration of  $2-4 \times 10^{15}/\text{cm}^3$ .
18. (Currently Amended) The method of claim 13 wherein said step (g)~~(f)~~ comprises:  
depositing phosphorous at an energy of 7-10 KeV with a zero degree tilt to provide a  
concentration of the impurity in a range of  $2-4 \times 10^{15}/\text{cm}^3$ .
19. (Currently Amended) The method of claim 13 wherein said step (g)~~(f)~~ comprises:  
depositing boron at an energy of 1.5-2.5 KeV with a zero degree tilt to provide a  
concentration of the impurity in a range of  $2-3 \times 10^{15}/\text{cm}^3$ .
20. (Currently Amended) The method of claim 13 further including the step, between steps  
(f) and (g), of:  
polishing the polysilicon ~~and substrate~~.
21. (Original) The method of claim 13 further including the step, between said steps (e) and  
(f), of:  
growing a gate oxide about the silicon region in said vias.